

## **ABSTRACT**

A reflective substrate is used to amplify the photon signal captured from overlying analyte domains containing photon emitters. The reflective substrate provides substantial desired signal amplification of the photon emissions from each domain via interference effects induced in the incident excitation and/or emission energies. A dielectric is interposed between the domains and the reflective surface, which has a thickness such that substantial destructive interference occurs with respect to emission photons or excitation photons or both at the attachment surface. When analyte domains have a three-dimensional structure such that a significant fraction of their volume extends at least  $\frac{1}{4}$  wavelength above the attachment surface provided by the dielectric, substantial constructive signal amplification can take place of signals generated within the analyte domains. Destructive interference relating to emissions arising from the plane of attachment surface yields significant reduction in spurious background emissions.